



Application Control Number 10/707,783 Filing Date 01/12/2004
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Revised Abstract

The HELI-SHAFT intake exhaust manifold system is comprised of a shaft with two helical and parallel runners cutout around its length. Surrounding the shaft is a sleeve of the same length to enclose and separate the two runners. The intake runner has an opening at the front end of the shaft to provide an inlet for the air/fuel mixture to enter from the intake plenum. Exhaust gases exit the rear of the shaft through the exhaust opening; thus allowing the air/fuel mixture and exhaust gases to travel through the sleeved shaft following the runners in a parallel path. The shaft also provides locations for spark plugs to be inserted. The sleeve contains port openings located over each intake and exhaust runner positioned to provide alignment during rotation with individual combustion chambers aligned in a row matching both the firing order and cycle timing of the engine.